



**Project-Specific
Non-radiological Characterization Plan

for

Building 776/777**

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1.0 INTRODUCTION

In accordance with the Rocky Flats Cleanup Agreement (RFCA) and the Decommissioning Program Plan (DPP), a non-radiological characterization will be conducted prior to demolition to ensure that decommissioning objectives have been achieved. Decommissioning objectives are presented in the Building 776/777 Demolition Plan, which is included as Appendix I of the Building 776/777 Decommissioning Operations Plan (DOP). Currently applicable programs and requirements for non-radiological contaminants of concern will provide information sufficient to establish that the objectives outlined in the DOP have been achieved. These programs and requirements are:

- Hazardous waste unit closure requirements per the DOP,
- Occupational Safety and Industrial Hygiene's Program Manual MAN-072-OS&IH (for beryllium),
- Rocky Flats' Polychlorinated Biphenyl (PCB) Compliance Guidance,
- Colorado Clean Air Act's Regulation #8 (for asbestos), and
- Rocky Flats' Environmental/Waste Compliance Guidance No. 27 Lead Based Paint (LBP) and LBP Debris Disposal.

The data generated by these existing programs are sufficient to enable project personnel to make final packaging, transport, and disposal decisions, refine as necessary proposed worker health and safety controls, and estimate waste volumes and waste types.

The purpose of this document is to

- 1) Capture the requirements of these existing programs by providing a single – source reference,
- 2) Avoid initiation of redundant sampling efforts, and
- 3) Specify the written deliverables that will be submitted to regulatory oversight.

In conjunction with the characterization, isolation controls will be established as appropriate to ensure that areas do not subsequently become chemically contaminated and that the characterization data remain valid. Controls will remain in effect until initiation of demolition.

Upon completion of the final non-radiological characterization of Building 776/777, (a) project-specific characterization report(s) will be prepared and submitted to the Department of Energy (DOE) and the Lead Regulatory Agency (LRA) for approval. The report(s) will document that the following activities have been completed:

- Building 776/777 RCRA regulated hazardous waste treatment and/or storage facilities have been closed in accordance with state RCRA requirements and Building 776/777's DOP closure plan, and
- Beryllium regulated and beryllium controlled areas have been closed in accordance with RFETS' Occupational Safety and Industrial Hygiene's Program Manual MAN-072-OS&IH, and
- PCBs have been properly dispositioned in accordance with RFETS' PCB Compliance Guidance, and
- Regulated asbestos has been removed in accordance with Colorado Clean Air Act's Regulation #8, and
- Containerized chemicals and wastes have been characterized, removed from the building, and dispositioned in accordance with site procedures prior to demolition. These activities will include wastes generated by radiological decontamination efforts.

1.1 BACKGROUND

The buildings' Reconnaissance Level Characterization Report (RLCR) was submitted to and accepted by CDPHE in 1998. The RLCR identified the following as potentially impacting Building 776/777:

- Hazardous constituents derived from hazardous waste
- Beryllium
- PCBs
- Asbestos
- Lead paint

Building 776/777 includes waste management units subject to Resource Conservation and Recovery Act (RCRA) (permitted, interim status, and mixed residue consent order). The buildings also conducted operations on beryllium parts, resulting in beryllium holdup in gloveboxes and ductwork, as well as in specific areas such as the building's Special Assembly rooms. The buildings have contained PCB items and equipment such as capacitors, ballasts, and transformers, and the pilot Fluidized Bed Incinerator was used for a PCB trial burn in 1980. The building construction incorporates a significant amount of Asbestos Containing Building Material (ACBM). At the time of the RLCR, chemical contaminants were present throughout the building as either containerized chemicals or wastes, or as components of the building (such as lead and/or PCB containing paint).

1.2 NON-RADIOLOGICAL PARAMETERS

1.2.1 Hazardous Waste

The project's existing DOP includes closure performance standards for regulated hazardous waste units. All regulated units will be closed in accordance with the DOP prior to demolition. Confirmatory sampling may be required for some or all units prior to unit closure. However, after closure is complete, no additional sampling of these areas will be required.

1.2.2 Beryllium

Building 776/777 has been evaluated for removable beryllium (Be) contamination, using both historical and process knowledge as well as sampling and analysis. Beryllium regulated and beryllium controlled areas will be closed prior to demolition. Building systems with internal contamination and beryllium contaminated equipment will be removed prior to demolition.

This section describes the beryllium characterization process as currently required by Rocky Flats' Chronic Beryllium Disease Prevention Program (CBDPP).

Building 776/777 currently has five beryllium controlled areas (removable surface contamination greater than or equal to $0.2 \mu\text{g}/100 \text{ cm}^2$, and/or airborne concentrations greater than or equal to $0.1 \mu\text{g}/\text{m}^3$):

- Room 424
- Room 432 above eight feet
- Room 452, 455, 457, 475 (Special Assembly)

- Advanced Size Reduction Facility
- Room 146 and 146C (Size Reduction Vault)

Building systems with internal beryllium contamination include:

- Zone 1 exhausts, gloveboxes, Zone 1 plenums
- Zone 2 plenums originating in Rooms 452, 455, 457, 475, 415
- Waste lines
- Process waste tanks

The project's industrial hygiene group will obtain beryllium smear samples as required by the site's CBDPP. Beryllium regulated and controlled areas and systems will be decontaminated, fixed, or removed prior to initiation of demolition activities.

Areas that were historically designated as beryllium areas must have adequate analytical data to support conclusions that no beryllium contamination above regulated levels is present. Pre-demolition samples consistent with the current site Pre-Demolition Survey Plan (PDSP) SHALL be obtained and analyzed prior to demolition. Strip out activities will be completed prior to characterization activities. If additional strip out is conducted after the characterization, confirmation sampling will have to be conducted. Survey units SHALL encompass the entire Building 776/777 floor space.

A scoping document showing the beryllium sample locations for each of the buildings' beryllium survey units will be prepared in advance of sampling for review by DOE and CDPHE.

If any single smear measurement equals or exceeds the investigation level of $0.1 \mu\text{g}/100 \text{ cm}^2$, but is less than $0.2 \mu\text{g}/100 \text{ cm}^2$, then a minimum of four additional biased measurements will be acquired to characterize the area of interest. All measurements will be compared with the unrestricted release level of $0.2 \mu\text{g}/100 \text{ cm}^2$. This allows for additional sampling at the discretion of sampling personnel to better define the potential for contamination. As an example, if more than one measurement exceeds the investigation level, then more than four additional biased measurements will be acquired. If all measurements are less than the unrestricted release level, the area is considered non-beryllium contaminated. If any measurement equals or exceeds the unrestricted release limit of $0.2 \mu\text{g}/100 \text{ cm}^2$, further sampling will be required to define the boundaries of contamination, or further decontamination will be performed in an attempt to meet the $0.2 \mu\text{g}/100 \text{ cm}^2$ standard.

Given the sample size determined for an area, a set of randomly generated coordinates will be used to locate each sample in the area. Coordinates will be generated before sampling activities commence. Samples will be taken in the indicated area on the horizontal surface(s) where beryllium could have settled. Each sample taken at a location will be described in the sampling log with respect to both location and sample source (i.e., floor, wall, etc.) in such a way that it is uniquely identified for follow-up sampling if needed. Biased samples will also be collected.

The total number of samples will be determined by the size of the area. One sample will be collected for every 100 square feet of floor area up to 1,000 square feet (or ten samples). An additional sample will be collected for every additional 200 square feet of floor area over 1,000 square feet up to 5,000 square feet total, and then one additional sample for every 500 square feet of floor area with a maximum of 75 samples per area. No matter how small the area is, a

minimum of five random samples will be collected. For example, in an area with 200 square feet, 5 random samples will be collected.

1.2.3 PCBs

Absent any unexpected discovery of PCB items during demolition, it is concluded that Building 776/777 does not contain PCB contamination subject to further management as PCB remediation waste. This conclusion is based upon RFETS' PCB Management Program that requires identification, characterization, removal, and off-site disposal of all PCB items (such as transformers, large and small capacitors, ballasts, etc.).

Although Buildings 776 and 777 will not harbor PCB items at the time of demolition, it is suspected that the buildings were painted with PCB bearing paint. PCB paints are classified as PCB bulk product waste by EPA regulation. PCB paints need not be sampled, and do not need to be removed prior to demolition, as long as restrictions regarding their disposal are met, as outlined 40 CFR 761.62.

776/777 project will conduct a final verification walkdown prior to demolition to document that there are no remaining PCB items in the building.

1.2.4. Asbestos

A Colorado Certified Asbestos Inspector will identify all homogeneous areas of friable and non-friable suspected asbestos containing building material (ACBM), and sample those areas not assumed to be ACBM per 40 CFR 763.85 through 763.87 and 4 CCR 1001- 10 (Regulation No. 8). The presence of asbestos (i.e., greater than 1% by volume, weight or area) will be determined by a certified asbestos laboratory with asbestos accreditation by the National Voluntary Laboratory Accreditation Program (NVLAP) using EPA Method 600/R-93/116, a polarized light microscopy (PLM) technique. Point counting will be required when PLM results range between trace and 1%. All analytical and quality specifications associated with the analysis are contained in the Kaiser-Hill Analytical Services Division Statement of Work, Industrial Hygiene, Asbestos Module IH02. All identified ACBM materials will be removed from Building 776/777 prior to initiation of demolition.

Prior to closure of an area impacted with ACBM, confirmatory air samples as required by Regulation No. 8 will be taken. When these air samples meet Reg. 8 requirements, the work area will be closed, and no additional sampling of these areas is required.

1.2.5 Scabbled paint

As required by Rocky Flats' Environmental/Waste Compliance Guidance No. 27, lead based paint (LBP) debris from Buildings 776/777 shall be managed as non-hazardous (solid) waste. Additional analysis for characteristics of hazardous waste for LBP debris is not a requirement for disposal. Any material resulting from scabbling activities (paint and concrete) will be characterized by in-process analytical data or process knowledge as required under RCRA, and will be dispositioned prior to decommissioning of the buildings.

1.3 LABORATORY ANALYSIS

If additional chemical characterization samples are required, laboratories contracted by RFETS Analytical Services Division will perform the analyses. Laboratories will perform work pursuant to requirements presented in the RFETS Statement of Work (SOW) for Analytical Measurements. The SOW is composed of several modules. The General Laboratory

Requirements Module, GR01, provides general technical and administrative requirements common to all analyses performed for the site. The General Requirements for Electronic Data Deliverables Module, GR02, provides requirements for the electronic delivery of data. Other SOW modules provide parameter-specific analytical, quality assurance/quality control, reporting, and general requirements specific to stated analytical tasks

1.4 DATA ANALYSIS AND QUALITY ASSESSMENT

1.4.1 Data Assessment

Data assessment will have three phases: verification, validation, and data quality assessment (DQA). Data verification will ensure that the requirements of this plan were met.

1.4.2 Analytical Method and Detection Limit

All reported characterization data will provide or reference the basis for the calculated detection limit. Practical quantitation limits (PQLs) will be provided (based on formal PQL studies) with all results. PQLs will be less than:

- For beryllium, 0.1 µg/100 cm²
- For asbestos, 1% by volume

1.4.3 Data Quality Assessment

Data Quality Assessment (DQA) is the scientific evaluation of data to determine if the data are of the right type, quality, and quantity to support the intended use. There are three steps in the DQA Process:

- Review the Data Quality Objectives (DQOs) and Design
- Conduct a Preliminary Data Review
- Draw Conclusions from the Data

These three steps are presented in a linear sequence, but the DQA process is applied in an iterative fashion. The strength of the DQA process is that it is designed to promote an understanding of how well the data will meet their intended use by progressing in a logical and efficient manner.

1.4.4 Quality Assurance and Quality Control Program

Quality assurance (QA) and quality control (QC) procedures will be implemented during the characterization to collect information necessary to evaluate the results. Specifically, quality is an integrated system of management activities involving planning, QC, quality assessment, reporting, and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence. QC is the overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer.

2.0 FINAL PROJECT-SPECIFIC CHARACTERIZATION REPORT

Upon completion of the final non-radiological characterization of Building 776/777, a project-specific characterization report will be prepared. Several sub-reports may be developed in lieu of a single large report in order to simplify and expedite the review process. The report(s) shall provide information in adequate detail to allow DOE to make a determination if the facility can

be released for demolition. The report format and content will be prepared in consultation with CDPHE. DOE will use the report(s) to confirm the building status, and will transmit the report and a notification letter to the LRA for concurrence. The specific deliverables in the report(s) will be:

- **Hazardous waste:** Documentation of closure for all RCRA regulated hazardous waste management units, consisting of contact records, e-mail communications, or similar documentation to and from CDPHE establishing that RCRA regulated hazardous waste management units have been closed per the project's DOP will be included.
- **Beryllium:** Documentation that the project's Industrial Hygiene group has released building surfaces as no longer subject to beryllium controls will be presented in the characterization report. Individual analytical reports will not be presented, as these data will be available for inspection in RFETS' computerized database. A tabulated summary of the beryllium results will be presented. This summary will include location information, to include room number, and specification of walls/ceiling/floor or equipment origin of the sample. The sampler will mark on the substrate the swipe's origin to facilitate subsequent sample re-location.
- **PCBs:** A contact record certifying that all PCB items have been removed and a walkdown completed to certify removal will be submitted. In addition, a copy of the correspondence to the receiving disposal facility(ies) that will receive PCB bulk product waste from the building's demolition will be provided.
- **Asbestos:** The post-asbestos removal report, submitted to CDPHE as required under Regulation No. 8, will not be incorporated into the building's characterization report. The characterization report will include a copy of CDPHE's Demolition Permit, which acknowledges that all identified ACBM has been removed.

3.0 REFERENCES

Building 776I777 Closure Project Decommissioning Operations Plan

Rocky Flats Environmental Technology Site RCRA Permit

Occupational Safety and Industrial Hygiene's Program Manual MAN-072-OS&IH Revision 1, Beryllium Disease Prevention, June 30, 2001

Rocky Flats' Polychlorinated Biphenyl (PCB) Compliance Guidance, October 2002

Colorado Clean Air Act's Regulation #8 (for asbestos), per 40 CFR 763.85 through 763.87 and 4 CCR 1001- 10

Rocky Flat's Environmental/Waste Compliance Guidance No. 27 Lead Based Paint (LBP) and LBP Debris Disposal

Rocky Flats Environmental Technology Site Pre-Demolition Survey Plan for D&D Activities, MAN-127-PDSP, July 15, 2002